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1967

1967

1966 OPERATING SUMMARY

# **WESTMINSTER**

## **water pollution control plant**

ONTARIO WATER RESOURCES COMMISSION

*Division of Plant Operations*

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ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

Members of the Westminster Local Advisory Committee,  
Township of Westminster.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the  
Westminster Water Pollution Control Plant, OWRC Project No. 59-S-33.

It is hoped that our joint participation in efforts to combat water pollution  
will have even more success in the coming year.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly", is written over the typed name.

D. S. Caverly,  
General Manager.



ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

J. A. VANCE, LL.D.  
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J. H. H. ROOT, M.P.P.  
VICE-CHAIRMAN

D. S. CAVERLY  
GENERAL MANAGER

W. S. MACDONNELL  
COMMISSION SECRETARY

General Manager,  
Ontario Water Resources Commission.

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Westminster Water Pollution Control Plant, OWRC Project No. 59-S-33.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

A handwritten signature in cursive script, appearing to read "B. C. Palmer".

B. C. Palmer, P. Eng.,  
Director,  
Division of Plant Operations.

## FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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# **WESTMINSTER**

## **water pollution control plant**

operated for

THE TOWNSHIP OF WESTMINSTER

by the

ONTARIO WATER RESOURCES COMMISSION

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### DIVISION OF PLANT OPERATIONS

DIRECTOR: B. C. Palmer

Assistant Director:	C. W. Perry
Regional Supervisor:	A. C. Beattie
Operations Engineer:	P. J. Osmond

801 Bay Street      Toronto 5

## **'66 REVIEW**

The total operating cost for 1966 was \$13,449.12, an increase of approximately \$2,800 over the 1965 cost of \$10,614.93. The cost per million gallons treated in 1966 was \$204.81, which is similar to the 1964 cost of \$205.53. The 1965 cost was lower than normal for this project.

The average daily flow for the year of 179,000 gallons represents a 17.8% increase over 1965, and 71.5% of the plant capacity. The increase represents 10.5% of the plant capacity. Treatment was still being accomplished by using one half of the aeration section, while aerobic digestion of waste sludge utilized the remainder of the capacity.

During 1966, raw sewage strengths of 91 ppm BOD and 172 ppm SS were experienced. The final effluent had an average BOD of 8 ppm and suspended solids of 14 ppm. These figures represent removal efficiencies of 91 and 92% respectively.

A chlorine residual of 0.5 ppm was maintained in the final effluent from May 15 to October 25.

A painting program was continued into 1966. The structure and grounds were well maintained and no major problems were encountered.

A new sewage pump was purchased towards the end of the year for installation early in 1967.

The Westminster Township plant is operated by one full time operator, D. C. Simpson, with assistance from a casual labourer on a part time basis. Further assistance and guidance are provided as well by the OWRC head office staff of engineers and technicians.

Plant supervision is based on a total of 40 hours per week, 36 occurring during the period from Monday to Friday inclusive and for 2 hours each on both Saturday and Sunday.

Mr. Simpson holds his Certificate of Qualification as a sewage works operator which he obtained in 1964. In October 1966 he attended the OWRC sponsored Chief Operators' Conference.



## PROJECT COSTS

NET CAPITAL COST (Final) \$270,727.24

DEDUCT - Payments from Municipality 65,773.40

Long Term Debt to OWRC \$204,953.84

Debt Retirement Balance at Credit  
(Sinking Fund) December 31, 1966 \$ 18,042.36

Net Operating \$ 13,449.12

Debt Retirement 17,673.00

Reserve 1,254.42

Interest Charged 11,531.18

TOTAL \$ 43,907.72

### RESERVE ACCOUNT

Balance at January 1, 1966 \$ 11,171.89

Deposited by Municipality 1,254.42

Interest Earned 646.15

\$ 13,072.46

Less Expenditures

Balance at December 31, 1966 \$ 13,072.46

## MONTHLY OPERATING COSTS

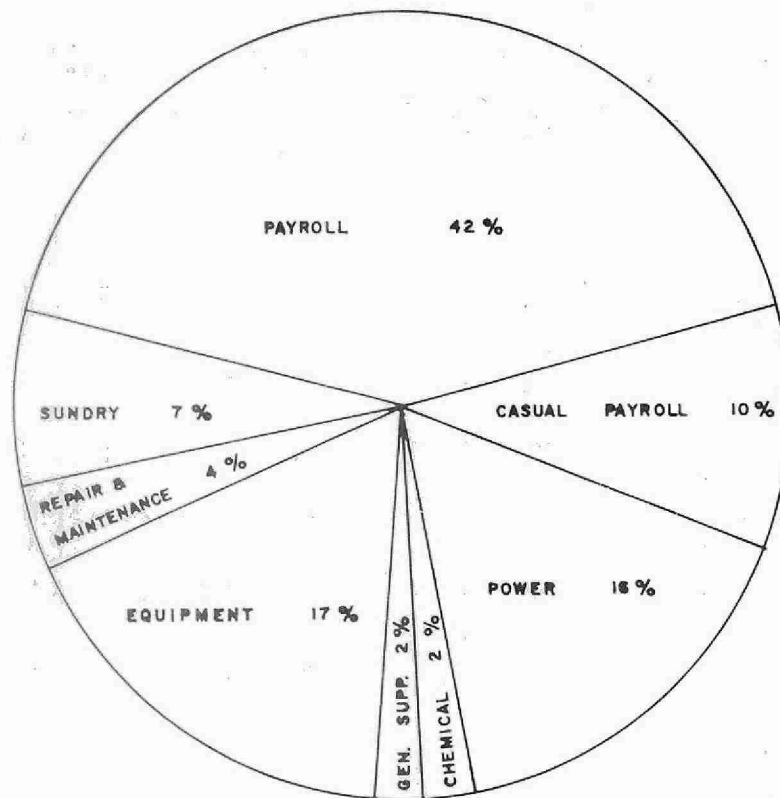
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY
JAN	665.13	394.54		221.11		25.58			23.90
FEB	831.25	407.21		229.90		5.50		28.12	160.52
MARCH	679.35	387.82		223.36		31.52		30.88	5.77
APRIL	991.57	786.52		194.88		4.40			5.77
MAY	1200.85	432.20	270.56	182.33	212.63	24.56		72.64	5.88
JUNE	1727.21	448.24	256.32	163.88		15.28	785.00	17.56	40.93
JULY	2252.49	398.98	254.06	156.38		29.26	1203.42	204.51	5.88
AUG	1001.13	435.58	255.70	156.88		38.35		108.74	5.88
SEPT	973.46	640.43	70.84	170.33		5.50		47.35	38.96
OCT	1053.36	429.41	21.17	157.38		31.16			414.24
NOV	1101.87	415.36	213.23	161.38	51.98	54.04			205.88
DEC	971.45	415.25		177.88		42.63	250.00		85.69
TOTAL	13449.12	5591.54	1341.88	2195.79	264.61	307.78	2238.42	509.80	999.30

\* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$200.00

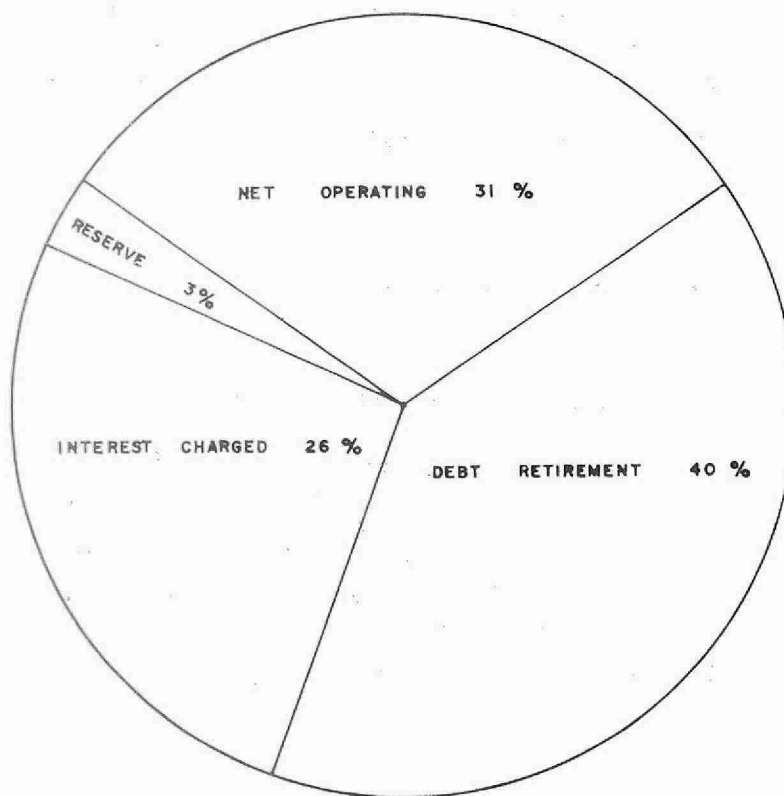
## YEARLY OPERATING COSTS

YEAR	M.G. TREATED	TOTAL COST	COST PER MILLION GALLONS
1963	22,613	\$ 8502.58	\$ 376.00
1964	52,469	10748.36	205.53
1965	55,719	10614.93	190.49
1966	65,665	13449.12	204.81

## 1966 OPERATING COSTS



## TOTAL ANNUAL COST

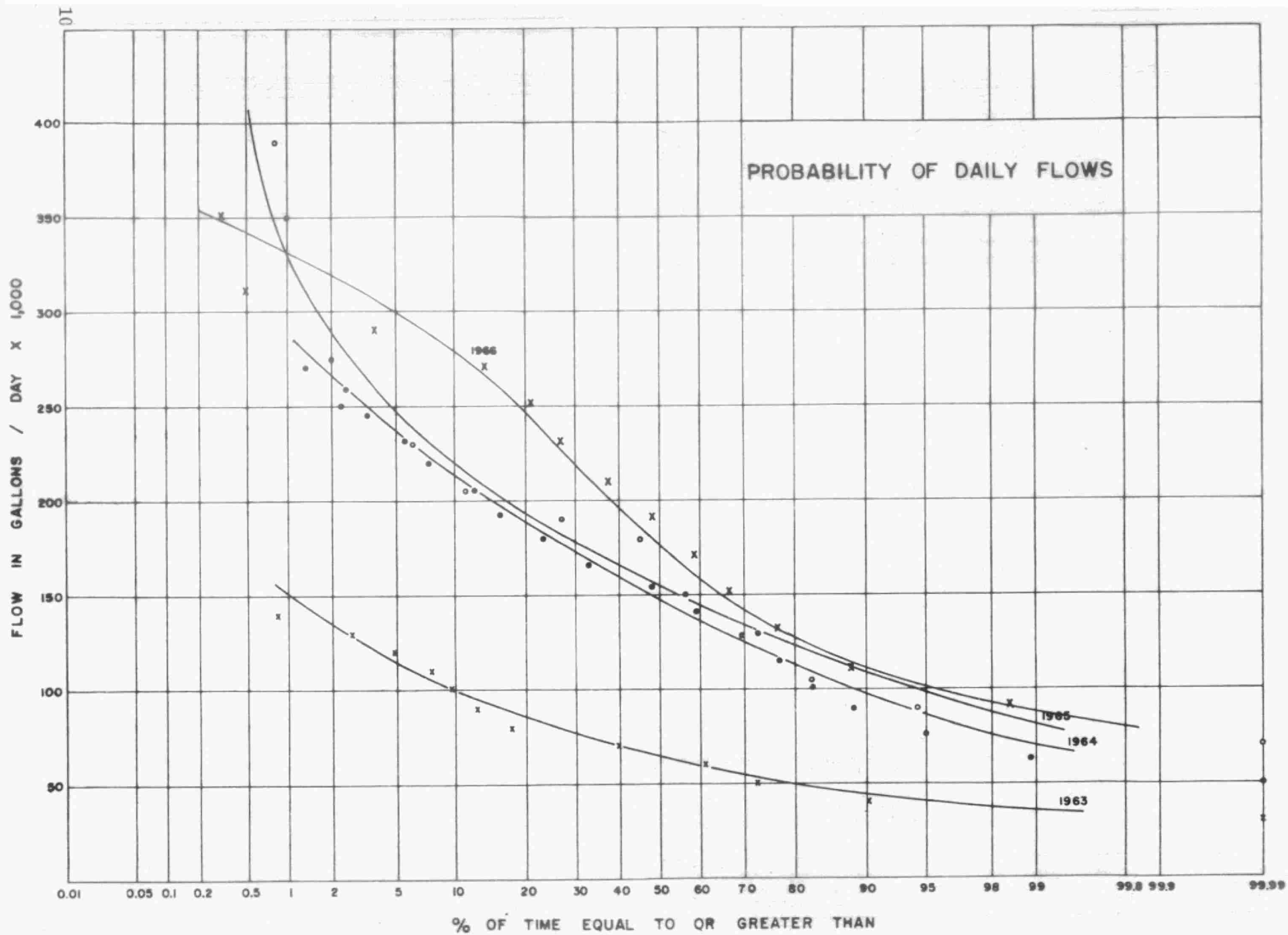


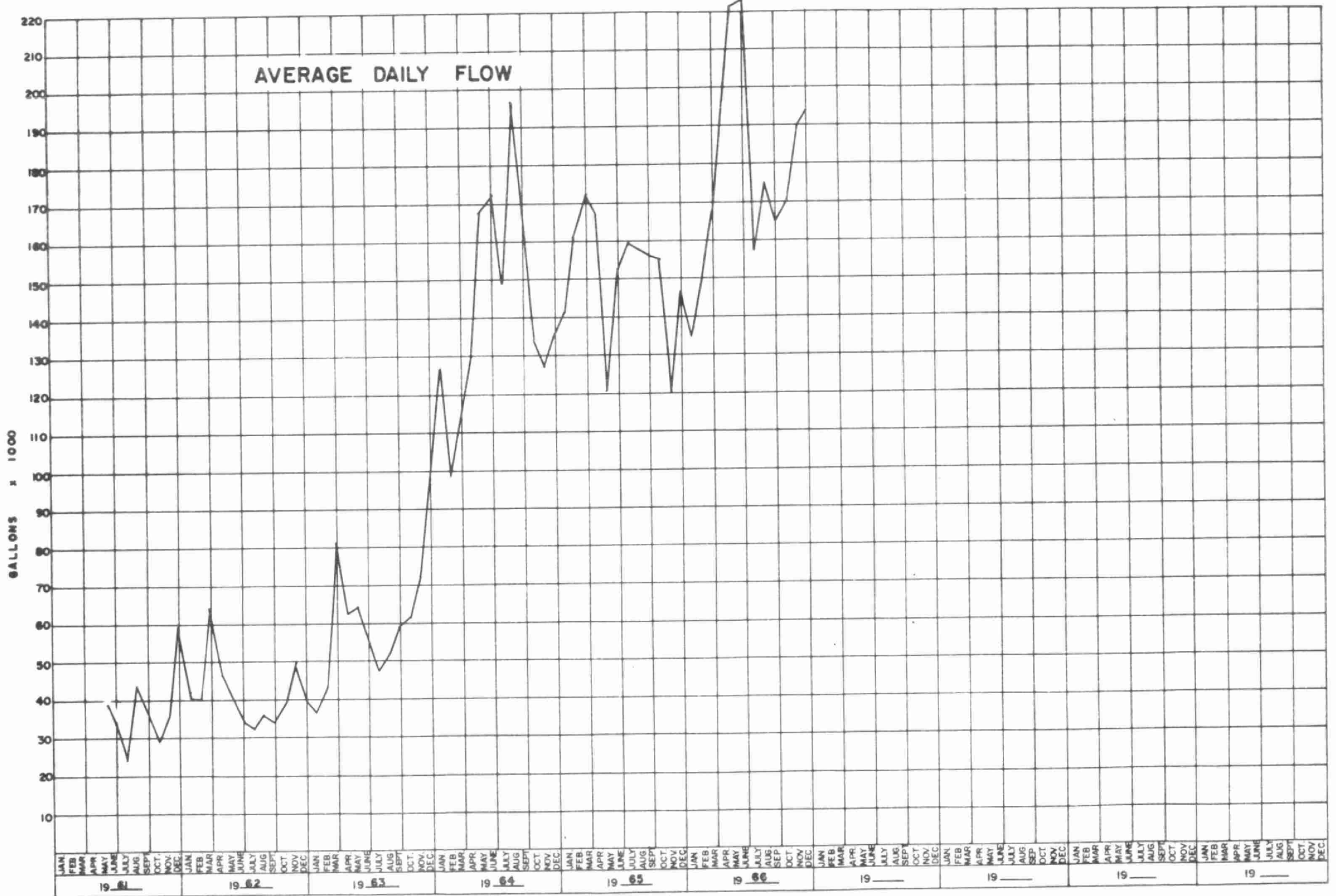
## **Process Data**

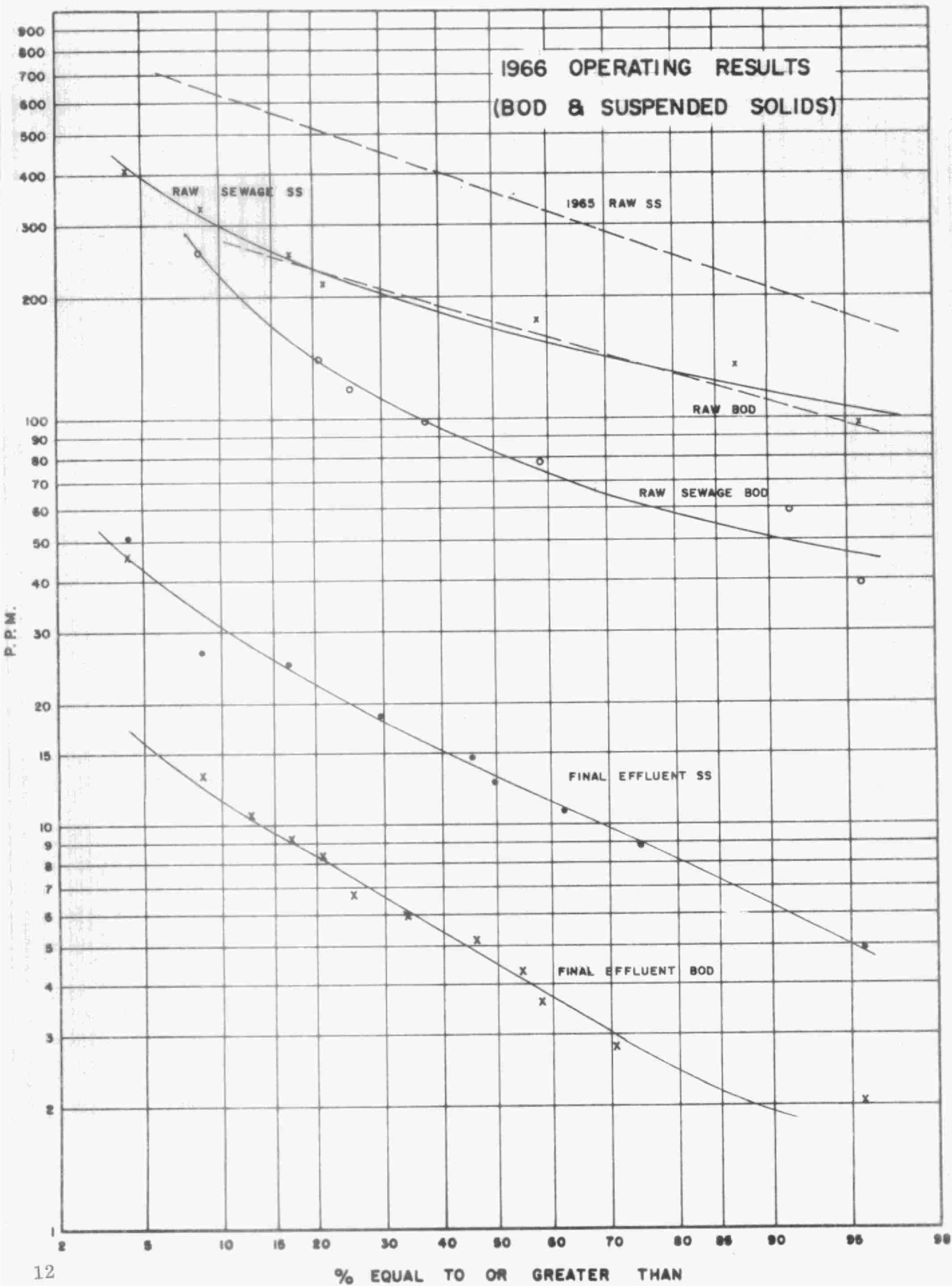
A total of 65.665 million gallons of sewage was treated at this plant in 1966 as compared to 55.719 million gallons in 1965. This is an increase of 9.946 million gallons or 17.8%. The average daily flow for the year was 179,000 gallons and represents 71.5% of the design flow of 250,000. The maximum average daily flow for a month occurred in June when the flow was 234,000 gallons, representing 93% of the design capacity. The maximum flow in any one day was 356,000 gallons on December 6.

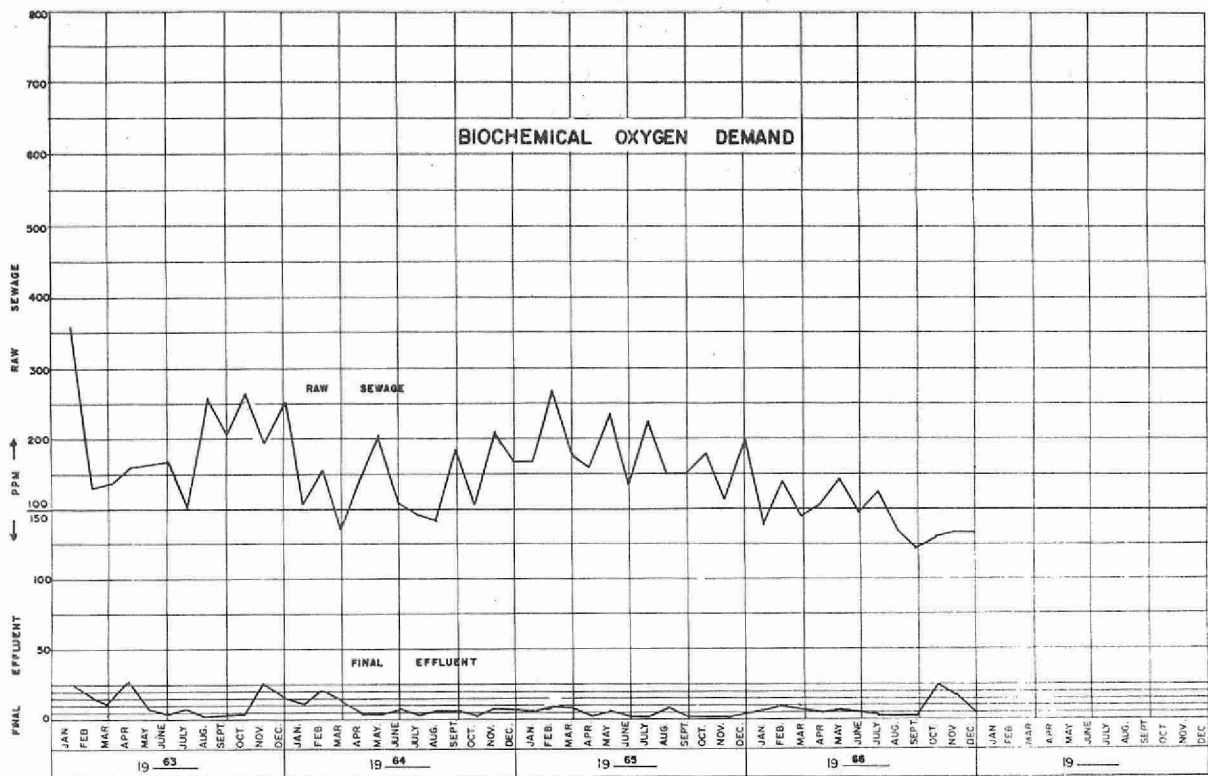
The probability of daily flow graph shows that the design flow was exceeded 20% of the time as compared to 5% in 1965.

The average daily flow graph shows a rapid increase in flows since the plant was put in operation in 1961. At the present rate of increase, the plant will exceed the design flow within three years.

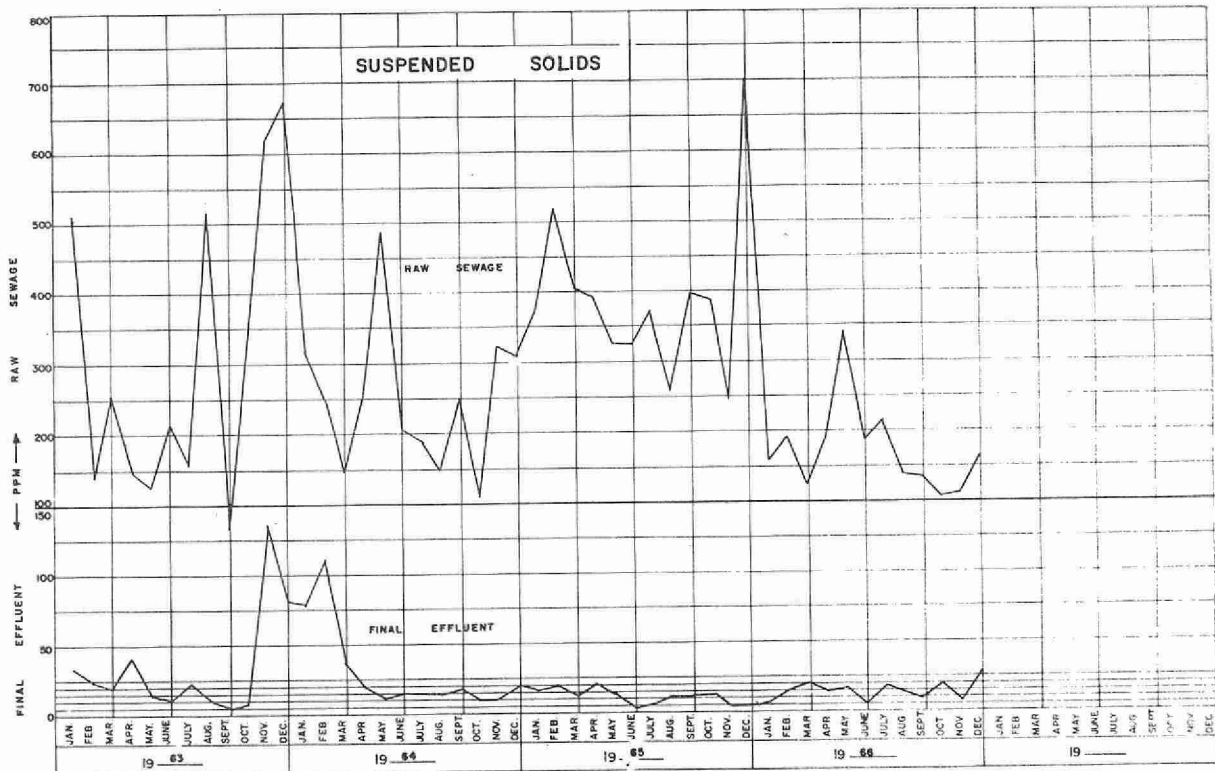








## MONTHLY VARIATIONS





## GRIT, B.O.D AND S. S. REMOVAL

MONTH	B. O. D.				S. S.			
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED
JAN.	78	7	91.0	1.5	158	6	96.0	3.2
FEB.	145	9	93.5	2.8	196	14	93.0	3.8
MAR.	90	7	92.0	2.1	124	20	84.0	2.7
APR.	108	6	94.5	3.0	187	14	92.5	5.1
MAY	149	7	95.5	4.9	340	16	95.5	11.3
JUNE	94	5	94.5	3.1	188	6	97.0	6.4
JULY	129	3	97.5	3.1	217	17	92.0	4.9
AUG.	70	2	97.0	1.8	141	13	90.5	3.5
SEPT.	42	2	95.0	1.0	136	9	93.5	3.2
OCT.	58	24	58.5	0.9	105	19	82.0	2.3
NOV.	66	17	74.0	1.4	113	8	93.0	3.0
DEC.	66	6	91.0	1.8	161	28	82.5	4.0
TOTAL	-	-	-	27.2	-	-	-	51.9
AVG.	91	8	91.0	2.3	172	14	92.0	4.3

### COMMENTS

The average strength of the raw sewage for the year was 91 ppm BOD and 172 ppm SS. These values are considerably lower than the 1965 values of 180 ppm and 393 ppm respectively. The final effluent had an average BOD of 8 ppm and an average SS of 14 ppm which resulted in an average reduction of 91% and 92% respectively.

From the probability graph, it can be seen that the effluent BOD met the OWRC objectives of 15 ppm 94% of the time and the SS objective of 15 ppm 57% of the time. The above results are based on composite samples taken every two weeks.

## AERATION SECTION

MONTH	* B.O.D. PPM.	MLSS. PPM.	LBS. BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	78	5928	1	5833
FEBRUARY	145	6000	3	2804
MARCH	90	6374	2	4166
APRIL	108	5623	3	2830
MAY	149	5051	5	1777
JUNE	94	4902	4	2760
JULY	129	6443	2	2834
AUGUST	70	6157	2	4798
SEPTEMBER	42	5860	1	8652
OCTOBER	58	5783	1	9724
NOVEMBER	66	6380	1	6106
DECEMBER	66	6488	2	4821
TOTAL	-	-	-	-
AVERAGE	91	5916	2	4759

\* Raw BOD extended aeration plant.

### COMMENTS

One tank of the aeration section was used for normal aeration and the other tank was used as an aerobic digester in 1966.

The average loading on the aeration tank was 2 pounds of BOD per 100 pounds of mixed liquor SS as compared to 4 pounds in 1965. The MLSS averaged 5916 ppm which is similar to the 1965 value of 5847 ppm. An average of 2759 cubic feet of air was required for each pound of BOD removed as compared to 2100 cubic feet in 1965. This increase results from the decrease in BOD loading at the plant, and the need for a minimum amount of air to maintain proper circulation of the aeration tank contents. Air for aerobic digestion was also included.

## CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	4,161	-	-
FEBRUARY	4,202	-	-
MARCH	5,122	-	-
APRIL	5,890	-	-
MAY	6,959	* 155	4.61
JUNE	7,013	328	4.68
JULY	4,882	302	6.18
AUGUST	5,451	307	5.63
SEPTEMBER	4,962	315	6.35
OCTOBER	5,275	** 241	5.67
NOVEMBER	5,728	-	-
DECEMBER	6,020	-	-
TOTAL	65,665	1648	-
AVERAGE	5,472	274	5.51

\* 15 days' chlorination

\*\* 25 days' chlorination

## COMMENTS

The final effluent was disinfected with chlorine from May 15 to October 25. A total of 1648 lbs. of chlorine was used for an average dosage of 5.51 ppm. A residual of at least 0.5 ppm was maintained during this period. The increased chlorine use over the 1965 value of 1352 lbs. reflects the increased flow through the plant.



## CONCLUSIONS

The plant operated at 71.5% capacity and still has some reserve capacity. However, if the flow increases at a rate similar to that averaged since 1961, the plant will be overloaded hydraulically by 1970. The plant produced an effluent meeting the OWRC objectives for BOD, 94% of the time; however, effluent suspended solids only met the objective 57% of the time. When it was possible to utilize them, the sand beds improved the quality of the effluent. The total cost of operation increased over the 1965 costs and brought the cost per million gallons treated to \$204.81. The plant was well maintained and operated during the year.

## RECOMMENDATIONS

It is recommended that a survey of local industry be conducted to determine the reasons for the substantial increase in flows and the abnormally weak sewage that has been entering the plant for the past year.